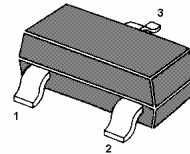


MMBT4401

NPN Silicon General Purpose Transistor

As complementary types the NPN transistor MMBT4403 is recommended.



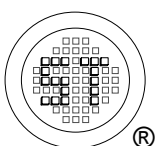
1. Base 2. Emitter 3. Collector

SOT-23 Plastic Package

Absolute Maximum Ratings ($T_a = 25\text{ }^\circ\text{C}$)

Parameter	Symbol	Value	Unit
Collector Base Voltage	V_{CBO}	60	V
Collector Emitter Voltage	V_{CEO}	40	V
Emitter Base Voltage	V_{EBO}	6	V
Collector Current Continuous	I_C	600	mA
Total Device Dissipation FR-5 Board ¹⁾ Derate above 25 °C	P_{tot}	200 1.8	mW mW/°C
Thermal Resistance Junction to Ambient	$R_{\theta JA}$	417	°C/W
Junction and Storage Temperature Range	T_J, T_s	-55 to +150	°C

¹⁾ FR-5 = 1 × 0.75 × 0.062 in.



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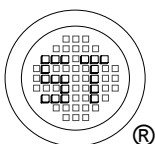


Dated : 23/12/2005

MMBT4401

Characteristics at $T_a = 25\text{ }^\circ\text{C}$

Parameter	Symbol	Min.	Max.	Unit	
DC Current Gain at $V_{CE} = 1\text{ V}$, $I_C = 0.1\text{ mA}$ at $V_{CE} = 1\text{ V}$, $I_C = 1\text{ mA}$ at $V_{CE} = 1\text{ V}$, $I_C = 10\text{ mA}$ at $V_{CE} = 1\text{ V}$, $I_C = 150\text{ mA}$ at $V_{CE} = 2\text{ V}$, $I_C = 500\text{ mA}$	h_{FE} h_{FE} h_{FE} h_{FE} h_{FE}	20 40 80 100 40	- - - 300 -	- - - - -	
Collector Emitter Saturation Voltage at $I_C = 150\text{ mA}$, $I_B = 15\text{ mA}$ at $I_C = 500\text{ mA}$, $I_B = 50\text{ mA}$	V_{CEsat} V_{CEsat}	- -	0.4 0.75	V V	
Base Emitter Saturation Voltage at $I_C = 150\text{ mA}$, $I_B = 15\text{ mA}$ at $I_C = 500\text{ mA}$, $I_B = 50\text{ mA}$	V_{BEsat} V_{BEsat}	0.75 -	0.95 1.2	V V	
Collector Cutoff Current at $V_{CB} = 35\text{ V}$	I_{CBO}	-	0.1	μA	
Base Cutoff Current at $V_{EB} = 5\text{ V}$	I_{EBO}	-	0.1	μA	
Collector Base Breakdown Voltage at $I_C = 0.1\text{ mA}$	$V_{(BR)CBO}$	60	-	V	
Collector Emitter Breakdown Voltage at $I_C = 1\text{ mA}$	$V_{(BR)CEO}$	40	-	V	
Emitter Base Breakdown Voltage at $I_E = 0.1\text{ mA}$	$V_{(BR)EBO}$	6	-	V	
Current Gain Bandwidth Product at $V_{CE} = 10\text{ V}$, $I_C = 20\text{ mA}$, $f = 100\text{ MHz}$	f_T	250	-	MHz	
Collector Base Capacitance at $V_{CB} = 5\text{ V}$, $I_E = 0$, $f = 1\text{ MHz}$	C_{cb}	-	6.5	pF	
Emitter Base Capacitance at $V_{EB} = 0.5\text{ V}$, $I_C = 0$, $f = 1\text{ MHz}$	C_{eb}	-	30	pF	
Input Impedance at $I_C = 1\text{ mA}$, $V_{CE} = 10\text{ V}$, $f = 1\text{ KHz}$	h_{ie}	1	15	K Ω	
Voltage Feedback Ratio at $I_C = 1\text{ mA}$, $V_{CE} = 10\text{ V}$, $f = 1\text{ KHz}$	h_{re}	0.1	8	$\times 10^{-4}$	
Small Signal Current Gain at $I_C = 1\text{ mA}$, $V_{CE} = 10\text{ V}$, $f = 1\text{ KHz}$	h_{fe}	40	500	-	
Output Admittance at $I_C = 1\text{ mA}$, $V_{CE} = 10\text{ V}$, $f = 1\text{ KHz}$	h_{oe}	1	100	μmhos	
Delay Time	$V_{CC} = 30\text{ V}$, $V_{EB} = 2\text{ V}$, $I_C = 150\text{ mA}$, $I_{B1} = 15\text{ mA}$ $V_{CC} = 30\text{ V}$, $I_C = 150\text{ mA}$, $I_{B1} = I_{B2} = 15\text{ mA}$	t_d	-	15	ns
Rise Time		t_r	-	20	ns
Storage Time		t_s	-	225	ns
Fall Time		t_f	-	30	ns



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ISO/TS 16949 : 2002
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ISO 14001:2004
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ISO 9001:2000
Certificate No. 0506098

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